

The opinion in support of the decision being entered today
is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEVEN TEIG and ANDREW CALDWELL

Appeal 2007-1500
Application 10/061,641
Technology Center 2800

Decided: July 18, 2007

Before HOWARD B. BLANKENSHIP, MAHSHID D. SAADAT, and
JOHN A. JEFFERY, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's
rejection of claims 1-18. We have jurisdiction under 35 U.S.C. § 6(b). We
reverse.

STATEMENT OF THE CASE

Appellants invented a layout for an integrated circuit (IC). The IC layout includes a first set of interconnect lines with ends that are in the shape of partial non-quadrilateral polygons, such as half-hexagons, half-octagons, etc. Such shapes more closely model actual conductive lines on the ICs as compared to traditional rectilinear interconnect line ends.¹ Claim 1 is illustrative:

1. An integrated-circuit ("IC") layout comprising:
 - a) a net with routable elements;
 - b) a first set of interconnect lines for connecting the routable elements of the net, wherein the interconnect lines have ends that are in the shape of partial non-quadrilateral polygons.

The Examiner relies on the following prior art reference to show unpatentability:

Yuyama

US 5,117,277

May 26, 1992

Claims 1-18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Yuyama.

Rather than repeat the arguments of Appellants or the Examiner, we refer to the Briefs and the Answer for their respective details. In this decision, we have considered only those arguments actually made by Appellants. Arguments which Appellants could have made but did not make in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

¹ *See generally* Specification 99:2 - 101:6.

OPINION

Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention as well as disclosing structure which is capable of performing the recited functional limitations. *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984); *W.L. Gore and Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554, 220 USPQ 303, 313 (Fed. Cir. 1983).

The Examiner has indicated how the claimed invention is deemed to be fully met by the disclosure of Yuyama (Answer 3-4). Regarding independent claim 1, Appellants argue that Yuyama does not disclose an IC layout with interconnect lines having ends in the shape of *partial* non-quadrilateral polygons. According to Appellants, the interconnects in Yuyama end in *regular* (i.e., complete) polygons – not partial polygons (Br. 4-5; Reply Br. 4-6).

To support this distinction, Appellants provide an annotated enlargement of Fig. 1 of Yuyama in the Brief's Evidence Appendix. Based on this depiction, Appellants contend that the connection portions 21A and 22A are complete hexagonal shapes (i.e., with six sides). Appellants further note that Yuyama describes in the accompanying description of the patent that the connection portions have various shapes that are complete shapes (e.g., complete hexagonal, complete octagonal, or complete polygonal shapes) (Br. 5-6; Ev. App. Exh. A; Reply Br. 6).

The Examiner argues that Fig. 1 of Yuyama shows that the interconnects in Yuyama end in a partial hexagonal shape – not a complete

shape. In this regard, the Examiner contends that the end of the interconnect has only five sides – not six – since one of the “sides” indicated by Appellants is actually a “solid bar” of the interconnect line itself (Answer 4-6).

At the outset, we agree with Appellants that the skilled artisan would not reasonably consider Yuyama’s connection portions 21A, 22A in Figure 1 to be “partial” non-quadrilateral polygons. Based on Yuyama’s teachings taken as a whole, the connection portions *themselves* are hexagonal.

But as the Examiner indicates, signal wirings 21, 22 merge with their respective connection portions as “solid bars.” Due to this merging, the Examiner takes the position that the “ends” of the interconnect lines in Yuyama have five sides -- not six.

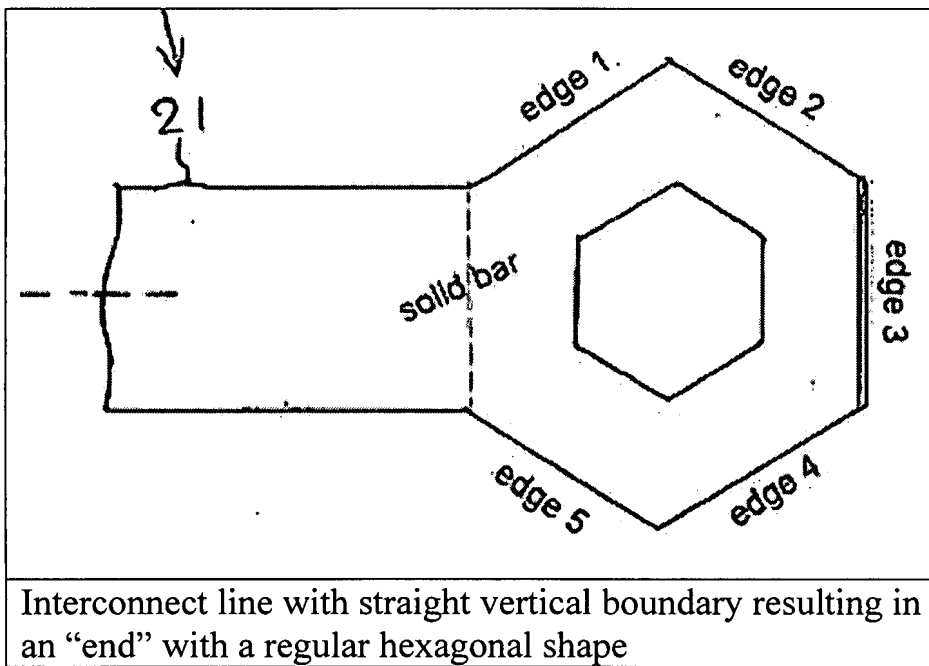
Notwithstanding the lack of a clear delineation between the signal lines and their corresponding connection portions in Yuyama, the reference nevertheless indicates that the connection portions have a *regular hexagonal shape* (Yuyama, col. 8, ll. 36-39). A regular hexagonal shape is not a partial hexagonal shape, but rather a hexagon with six sides. Significantly, Yuyama explains that connection holes 31 also have a regular hexagonal shape (Yuyama, col. 8, ll. 39-40) -- a shape that is clearly shown with six sides in Figure 1.

But independent claim 1 does not recite that the *connection portions* have the claimed partial polygonal shape. Rather, the claim merely recites that the *ends* have such a shape.

Given these considerations, our determination turns on a relatively narrow question: what reasonably constitutes the “end” of an interconnect line? For if the “ends” of the signal wirings 21, 22 in Yuyama constitute the

entire connection portions 21A, 22A, they must be regular hexagonal shapes in accordance with the reference's accompanying description. But if these "ends" do not constitute the entire connection portion, then partial hexagonal shapes would result and therefore meet the disputed limitation.

For example, if the boundary between the signal line 21 and its "end" was a straight vertical line as shown below,² then the resulting "end" of the signal line would be a hexagon. If, however, the boundary was not a vertical line (e.g., an angled line), the resulting "end" would not have a hexagonal shape.



We will not sustain the Examiner's rejection of independent claim 1 essentially for the reasons noted by Appellants. Although the signal wirings

² The figure in this opinion is reproduced from a portion of the Examiner's annotated drawings on Page 5 of the Answer for clarity.

and their respective connection portions form a unitary structure (i.e., a “solid bar”) as the Examiner indicates, we nevertheless conclude that the entire hexagonal connection portion is the most reasonable portion in Yuyama to constitute the “end” of the interconnect line (signal wiring) in light of the reference’s teachings taken as a whole.

Throughout the reference, Yuyama not only clearly distinguishes the hexagonal connection portions from their associated signal wirings, the reference unambiguously states that these portions have a regular hexagonal shape. *See, e.g.*, Yuyama, col. 7, ll. 50-52; col. 9, ll. 12-14 and 36-39. To construe the “ends” as having anything other than a regular hexagonal shape would require us to arbitrarily designate the boundary between the signal wiring and the connection portion as something other than the vertical boundary between the two distinct portions. While such an arbitrary decision would result in an “end” of the signal wiring to have a shape other than a regular hexagon, such a geometrical exercise would simply run counter to the teachings of Yuyama.

For at least these reasons, we will not sustain the Examiner’s rejection of independent claim 1. Likewise, we will not sustain the Examiner’s rejection of claims 2-17 which fall with claim 1.

DECISION

We have not sustained the Examiner's rejection with respect to all claims on appeal. Therefore, the Examiner’s decision rejecting claims 1-18 is reversed.

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REVERSED

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